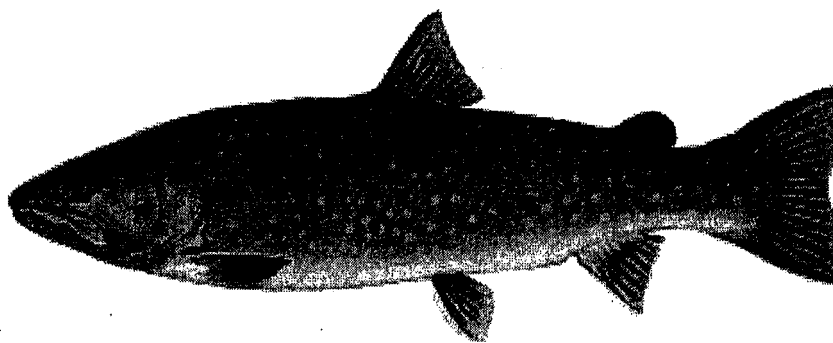




DEADWOOD RIVER BULL TROUT STUDY

INTERIM REPORT FOR 1997 STUDIES

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by

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ABSTRACT

Gill net and trap net sampling of Deadwood Reservoir in May and June, 1997 captured only ten bull trout (*Salvelinus confluentus*) in 125 hours of short-term daylight sinking gill net sets and 98 overnight trapnet sets. Four radio transmitters were surgically implanted in bull trout and the fish tracked into the fall. Only one bull trout was confirmed to have entered Trail Creek a tributary to the reservoir. Tributaries to the reservoir, the Deadwood River, and its tributaries were electrofished to capture and mark all bull trout encountered. Only Trail Creek had any larger bull trout captured in it, a 370 mm individual.

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INTRODUCTION

The upper Deadwood River drainage and Deadwood Reservoir were investigated to document population levels of bull trout (*Salvelinus confluentus*) by fisheries management staff of the Southwest Region of Idaho Department of Fish and Game (IDFG) under contract with Bureau of Reclamation (BOR), Pacific Northwest Region during the 1997 field season. The primary objectives of the studies were to define the distribution and status of resident, fluvial, and adfluvial components of the bull trout population in the Deadwood River drainage and to determine the impacts that Deadwood Reservoir operations have on the bull trout population. Three tasks were identified to complete in 1997: 1) sample Deadwood Reservoir in the spring of 1997 to capture adult bull trout and implant radio transmitters to allow monitoring movements of adfluvial bull trout, 2) radio track any implanted bull trout through the season to identify spawning tributaries, and 3) utilize electrofishing techniques to sample known bull trout tributaries to capture and mark resident/fluvial bull trout to allow monitoring of bull trout movements in the future.

Bull trout are routinely captured in standard fish management gill net sampling of Deadwood Reservoir. Number and size of captured bull trout are small, generally less than 350mm and less than 1.0% of the total catch by number and weight (Allen et al. 1996). Routine IDFG gill net sampling is conducted in September prior to when adult spawners return to the reservoir following spawning. We hypothesized that spring sampling would provide an opportunity to sample large bull trout.

The Deadwood River and tributaries above the reservoir and reservoir tributaries have bull trout populations present. The average size of bull trout in the tributaries documented is small, generally under 300 mm (USFS, file data). The general size of bull trout found in the tributaries suggest that they are resident forms and may not interact with the reservoir fish. An attempt was made to capture and mark individual bull trout in the tributaries to see if there was movement between the reservoir and specific tributaries.

METHODS

Reservoir Sampling

Three sample trips were conducted to Deadwood Reservoir during spring 1997. Sample period 1 was from 5/28/97 to 6/4/97; sample 2 from 6/9/97 to 6/12/97; both of these trips took place before the roads opened from winter snowpack and thus necessitated using fixed wing aircraft to land at the airstrip. Sample 3 was conducted from 6/24/97 to 6/27/97. Sample techniques consisted of short-term (1-4 hour duration) experimental sinking gill net sets and overnight trap net sets.

Sinking experimental design gill nets were 150 ft in length, 6 ft in depth and consisted of six 25 ft panels of different mesh sizes. The monofilament square mesh ranged in size from 3/4", 1", 1 1/4", 1 1/2", 2", and 2 1/2". Trap nets were of standard IDFG style with two light steel frames measuring 6 ft by 3 ft, covered with 3/4" square black mesh, and with five 30" steel round hoops with crowfoot throats on first and third hoops, the leads were 75 ft long and 3 ft or 4 ft in height.

Gill nets were typically set for one hour, the nets were then pulled, fish removed and the nets reset. Total hours of actual soak time were recorded for each day. Occasional gill nets were set overnight and retrieved the next morning, overnight gill net data was recorded separately from hourly gill net data. Gill nets were anchored on or near shoreline, and extended into the reservoir perpendicular to the shore. Mesh size at shoreline was typically alternated from small to large on each set. Fish were measured for total length in mm, and weighed to the nearest gram. Non salmonid species were counted; a subset were measured for length and weight. Trap nets were set perpendicular to the shore in shallow water with the top of frame near water surface and the lead anchored to shore. Traps were left to fish overnight, then pulled, emptied, the fish data collected and then the nets were reset in a different location. Trap net data was recorded as overnight sets per individual net.

Bull Trout Radio Tagging

Adult bull trout captured were placed in a net-pen and held for one day before surgically implanting radio transmitters. Implant techniques were modified from Ross and Kleiner (1982). Two sizes of ATS radio transmitters (Advanced Telemetry Systems Inc., Instanti, MN) were available for implantation with average transmitter weights of 5.1g and 7.1g. A 2% ratio of radio to body weight was used to define the minimum size of bull trout that could be tagged. All radio frequencies were 151 MHz cycle, with a pulse width of 22 millisecs. The duty cycle of the radio transmitters was set to be on from 9AM -4PM Friday then off until the following Friday. A Lotec model SRX 400 (Lotec Engineering Inc., Ontario, Canada) receiver and hand-held antenna was used to receive radio signals from the implants. Radio frequency monitoring was conducted on Fridays from 9AM until finished. Tracking was completed by cruising the perimeter of the reservoir with an outboard motorboat and/or driving the Deadwood River road. Several flights with fixed wing aircraft with radio receiver equipment were taken over the whole drainage.

Deadwood River

The Deadwood River above the reservoir was sampled utilizing a "gang probe" electrofishing unit. The equipment consisted of a small inflatable pontoon raft with 2.4m long by 0.4m diameter float tubes and metal and wood frame on top. A 5000 watt generator, Colfelt VVP-15 electrofishing control box, and a large fish tub were attached to the raft. Three hand-held probes were carried by samplers with one of the probes controlling the current with a safety switch. The hand-held probes were the anodes and a stainless steel wiring harness hung from the raft as the cathode. Constant DC was

output into the water. Electrofishing consisted of moving upstream with the netters each having a anode and long-handled net actively capturing fish as they become immobilized. After capture all fish were placed in the tub on the raft until processed. Possessing included, identifying species, measuring for total length in mm, weighing to the nearest g, and then releasing the fish. One pass electrofishing was done unless bull trout were captured. If bull trout were captured a second pass was done and a population size was estimated.

Tributary Sampling

Backpack electrofishing was conducted on tributary streams to Deadwood Reservoir and to tributaries of the Deadwood River above the reservoir. These small tributaries were electrofished by a two person crew beginning at the tributary mouth and proceeding upstream. All bull trout encountered were marked by clipping the adipose fin, measured and weighed, and a scale sample taken before releasing the fish.

RESULTS

Reservoir Sampling

A total of ten bull trout were captured during the three sampling sessions on Deadwood Reservoir. Table 1 lists the individual bull trout, length, weight, date of capture, radio frequency, method of capture, and or mortality. A total of 98 overnight trap net sets, 125 hours of daylight gill net sets, and 8 overnight gill net sets were accomplished.

Sample period 1 captured 5 bull trout with a mean length of 349mm (se 6.5) and a mean weight of 405g (se 35). Total sampling effort include 42 trap net nights, 66 hours of hourly gill netting and 4 nights overnight gill nets. Overnight gill nets captured 0.25 bull trout per net night and 0.02 bull trout were captured per trap net-night. No bull trout were captured in the gill nets set during daylight (Table 2). Additionally the following fish species were captured in the sampling gears: Atlantic salmon, *Salmo salar*; hatchery rainbow trout, *Oncorhynchus mykiss*; kokanee salmon, *Oncorhynchus nerka*; longnose dace, *Rhinichthys cataractae*, mountain whitefish, *Prosopium williamsoni*; rainbow trout X cutthroat trout hybrid, *O. clarki*; redband shiner, *Richardsonius balteatus*; speckled dace, *Rhinichthys osculus*; westslope cutthroat trout, *O. clarki lewisi*; and redband trout, *O. mykiss gairdneri*.

During the second sampling week only one bull trout was captured in a trap net. The bull trout was 250mm and weighed 150g (Table 3). Trap net catch was 0.04 bull trout per trap net night (Table 3). Hatchery planted Gerrard rainbow trout, *O. mykiss gairdneri*, was the only new fish species encountered.

During the last sample period four bull trout were captured by hourly sinking gill nets. Mean length was 289mm and mean weight was 236.3g. Catch per hour of day-light

sinking gill net was 0.10 per hour. Lengths and weights of other fish species were not collected.

Five of ten bull trout captured in the reservoir died. Gill nets were responsible for four of five mortalities (Table 1). The last sample period beginning June 27th had 75% mortalities, likely from a slight increase in water temperature. These mortalities are higher than experienced by Flatter (in press) using the same sampling gears and techniques in Arrowrock Reservoir.

The sampling gear was moved around the lake considerably in efforts to capture bull trout. If a net did not capture a bull trout it was moved to a different location. We tried to sample all differing types of shoreline habitats. All major creek mouths were sampled by both gears as much as practical. The first sample session at the end of May was probably three weeks after the ice left the reservoir. We may have been more successful if we had sampled closer to ice-off in early May. Sampling a smaller reservoir pool just after ice-off may have been more successful for locating bull trout.

Radio Tracking

Four bull trout were held and radio transmitters were surgically implanted (Table 1). The radio tagged fish were released and periodically attempts were made to locate their radio signals with a portable receiver. Table 4 provides dates of tracking and locations of the fish found. Radio frequency 151.882 was the only bull trout located in a tributary. This trout was the largest implanted and definitively moved into Trail Creek several km. One other bull trout was located earlier in the study (151.763) in the Trail Creek arm of the reservoir, but was never located in a tributary. Due to the small numbers of bull trout captured the number of tracking attempts were reduced to save funds. Two bull trout were never located after implanting and release.

Deadwood River Sampling

Electrofishing on the Deadwood River above the reservoir was accomplished at eight sites during July. Site locations are identified in Appendix A. Bull trout were captured at only the upper two sites above the East Fork Deadwood River. The bull trout captured were generally small in size and were likely resident form. At the upper two sites only bull trout were present whereas at the lower sites redband, westslope cutthroat, and mountain whitefish, and dace were present (Appendix B). We did not sample any bull trout in the Deadwood River that we would consider large enough to be fluvial forms.

Tributary Sampling

All tributaries to Deadwood Reservoir were electrofished to mark all captured bull trout to allow later identification as a tributary fish if later captured in the reservoir. Bull trout were captured in Trail, Daisy, South Fork Beaver, Beaver, and Wild Buck Creeks. No bull trout were found in Moulding and Basin Creeks, also several smaller tributaries

were dry by the August sampling dates. A total of 145 individual bull trout were marked in the reservoir tributaries. Only one bull trout captured was greater than 300 mm in any tributary. Length frequencies of sampled tributary fish are in Appendix B.

Tributaries to the Deadwood River above the reservoir were also sampled to mark any bull trout encountered. Bull trout were sampled in North and South Fork Deer and Stratton Creeks, the upper-most Deadwood River also had bull trout captured and marked (Appendix A). A total of 140 bull trout were marked in these stream reaches. The bull trout were mostly located in the upper headwaters of these streams. The adipose fin was clipped on these fish also, so there is not a method to differentiate between bull trout from reservoir tributaries and Deadwood River tributaries if found in the reservoir.

RECOMMENDATIONS

1. Conduct one more early season reservoir sampling trip immediately after ice-off. An earlier trip should allow sampling of a smaller reservoir pool before snow-melt run-off.
2. Install and monitor several tributary weirs during the early sampling trip to discover if bull trout follow spawning westslope cutthroat and redband trout into tributaries.
3. Sample the Deadwood River from the dam to the confluence with the South Fork Payette River during August to document any fluvial bull trout use of the river.

Table 1. Deadwood Reservoir bull trout lengths, weights, date of capture, method of capture, radio frequency of tagged fish, and handling mortality for captured bull trout in the spring of 1997.

Total Length mm	Weight g	Date of Capture	Method of capture	Radio Frequency	Handling Mortality
342	370	5/31/97	TN		M
355	440	5/31/97	SGN		M
345	385	6/1/97	TN	151.763	
492	1200	6/1/97	TN	151.882	
341	390	6/3/97	SGN	151.723	
250	150	6/12/97	TN		
270	175	6/27/97	HSGN	151.503	
322	360	6/27/97	HSGN		M
277	210	6/27/97	HSGN		M
287	200	6/27/97	HSGN		M

TN = Trap net

SGN = Overnight set of experimental sinking gill net

HSGN = Hourly daytime set of experimental sinking gill net

Table 2. Summary of catch statistics for the sample period of 5/29/97 to 6/3/97 on Deadwood Reservoir.

Lowland Lake Fish Sample Report						
Lake Name		DEADWOOD RES				
Water Number		0900000117		Sample Date	5/29/97	
	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
ATL Atlantic salmon						
HSGN (=number caught per hour of sinking gill net)						
	33	0.02	333	265		0.00
	38	0.02	385	385		0.01
	HSGN Total	0.03	359	325		0.01
	S.E.		26.0	60.0		
SGN (=number caught per sinking gill net night)						
	33	0.25	330	265		0.07
	SGN Total	0.25	330	238		0.07
	S.E.					
TN (=number caught per net night)						
	38	0.02	380	385		0.01
	TN Total	0.02	380			0.01
	S.E.					
ATL Total						
	Total	0.30	357	296		0.09
	S.E.		14.8	45.2		
Standard Unit Catch						
	% by Number	0.5 %.		% by Weight	0.7 %.	
BLT Bull trout						
SGN (=number caught per sinking gill net night)						
	35	0.25	355	440		0.11
	SGN Total	0.25	355	440		0.11
	S.E.					
TN (=number caught per net night)						
	34	0.02	342	370		0.01
	TN Total	0.02	342	370		0.01
	S.E.					
BLT Total						
	Total	0.27	349	405		0.12
	S.E.		6.5	35.0		
Standard Unit Catch						
	% by Number	0.5 %.		% by Weight	1.0 %.	
HRB Hatchery rainbow trout						

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
HSGN (=number caught per hour of sinking gill net)						
	25	0.02	250	143	83.28	0.00
	26	0.02	264	145	71.32	0.00
	32	0.02	325	300	77.50	0.00
	HSGN Total	0.05	280	196		0.01
	S.E.		23.0	52.0		
SGN (=number caught per sinking gill net night)						
	27	0.33	270	215	98.64	0.07
	28	0.33	280	200	81.98	0.07
	29	0.33	290	204	75.01	0.07
	31	0.67	315	260	74.35	0.17
	34	0.33	340	355	79.75	0.12
	SGN Total	2.00	302	249		0.50
	S.E.		10.7	23.9		
TN (=number caught per net night)						
	27	0.05	275	215	90.89	0.01
	28	0.02	287	200	83.54	0.00
	29	0.05	297	204	83.72	0.01
	31	0.02	316	260		0.01
	32	0.02	320	300	85.38	0.01
	33	0.02	336	0		0.00
	34	0.02	342	355	77.21	0.01
	36	0.02	365	0		0.00
	TN Total	0.24	311	263		0.05
	S.E.		9.6	24.2		
HRB						
	Total	2.28	303	244		0.55
	S.E.		7.1	16.9		
Standard Unit Catch						
	% by Number	4.0 %.		% by Weight	4.5 %.	
KOK Kokanee salmon						
HSGN (=number caught per hour of sinking gill net)						
	32	0.02	321	0		0.00
	HSGN Total	0.02	321			0.00
	S.E.					
SGN (=number caught per sinking gill net night)						
	26	0.25	265	162		0.04
	33	0.25	337	315		0.08
	34	0.25	346	348		0.09
	35	0.25	356	365		0.09

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
SGN	Total	1.00	326	298		0.30
	S.E.		20.7	46.3		
KOK	Total	1.02	325	298		0.30
	S.E.		16.1	46.3		
Standard Unit Catch						
	% by Number	1.8 %.		% by Weight	2.4 %.	
LND	Longnose dace					
TN	(=number caught per net night)					
	9	0.02	95	0	0.00	0.00
	12	0.02	125	0	0.00	0.00
TN	Total	0.05	110	0		0.00
	S.E.		15.0	0.0		
LND	Total	0.05	110	0		0.00
	S.E.		15.0	0.0		
Standard Unit Catch						
	% by Number	0.1 %.		% by Weight	0.0 %.	
MWF	Mountain whitefish					
HSGN	(=number caught per hour of sinking gill net)					
	20	0.05	208	78	87.19	0.00
	21	0.10	216	85	84.73	0.01
	22	0.31	223	125	112.12	0.04
	23	0.36	234	110	88.26	0.04
	24	0.26	243	121	82.33	0.03
	25	0.36	254	115	70.93	0.04
	26	0.10	264	140	76.76	0.01
	27	0.16	275	173	80.96	0.03
	28	0.42	284	188	80.13	0.08
	29	0.16	295	222	84.39	0.03
	30	0.16	302	223	81.04	0.03
	31	0.16	312	270	87.58	0.04
	32	0.21	325	327	95.41	0.07
	33	0.21	333	323	86.75	0.07
	34	0.05	343	0		0.00
	35	0.31	354	425	96.18	0.13
	36	0.10	366	400	82.45	0.04
	37	0.05	376	0		0.00
	38	0.05	388	0		0.00
	39	0.05	396	575	91.00	0.03

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
HSGN Total		3.64	285	217		0.73
S.E.			5.9	21.0		
SGN	(=number caught per sinking gill net night)					
	20	1.20	203	78	145.80	0.09
	21	0.60	210	85	89.03	0.05
	22	0.60	225	125	88.06	0.07
	23	1.20	233	110	79.77	0.13
	24	1.80	242	121	87.35	0.22
	25	4.79	251	115	83.15	0.55
	26	3.60	263	140	81.47	0.50
	27	3.00	274	173	80.31	0.52
	28	1.20	282	188	82.08	0.23
	29	1.20	295	222	85.12	0.27
	30	1.80	303	223	90.16	0.40
	31	1.80	312	270	81.08	0.49
	32	1.80	322	327	79.83	0.59
	33	2.40	333	323	91.91	0.77
	34	3.00	344	0	84.30	0.00
	35	3.00	351	425	90.50	1.27
	36	1.80	362	400	83.99	0.72
	37	1.20	373	0	85.66	0.00
	38	0.60	380	0	92.92	0.00
	40	1.20	401	575	87.59	0.69
SGN Total		37.75	298	250		7.56
S.E.			6.4	16.3		
TN	(=number caught per net night)					
	12	0.12	125	0		0.00
	13	0.08	137	0		0.00
	21	0.04	215	85		0.00
	22	0.04	227	125	96.01	0.01
	24	0.04	247	121		0.00
	28	0.16	285	188	83.78	0.03
	29	0.08	292	222		0.02
	30	0.08	303	223		0.02
	31	0.08	318	270		0.02
	32	0.12	322	327	95.81	0.04
	33	0.04	332	323		0.01
	34	0.08	344	0	87.74	0.00
	36	0.04	362	400	86.26	0.02
	38	0.04	380	0		0.00
	42	0.04	420	0		0.00
TN Total		1.10	276	282		0.17
S.E.			15.9	56.1		

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
MWF	Total	42.48	289	241		8.46
	S.E.		4.5	12.6		

Standard Unit Catch

% by Number 74.9 %.

% by Weight 68.1 %.

RCT Rainbow X cutthroat hybrid

TN (=number caught per net night)

	28	0.02	285	0	0.00
	29	0.02	290	0	0.00
	34	0.02	342	360	0.01
	35	0.02	357	0	0.00
	38	0.02	380	0	0.00
TN	Total	0.12	331	360	0.01
	S.E.		18.7		

RCT	Total	0.12	331	360	0.01
	S.E.		18.7		

Standard Unit Catch

% by Number 0.2 %.

% by Weight 0.1 %.

RSS Redside shiner

TN (=number caught per net night)

	7	0.06	75	0	0.00
	8	0.12	86	7	0.00
	9	0.37	94	8	0.00
	10	0.19	104	0	0.00
	11	0.44	113	0	0.00
	12	0.06	126	0	0.00
	13	0.06	130	0	0.00
TN	Total	1.31	103	8	0.00
	S.E.		3.1	0.3	

RSS	Total	1.31	103	8	0.00
	S.E.		3.1	0.3	

Standard Unit Catch

% by Number 2.3 %.

% by Weight 0.0 %.

SPD Speckled dace

TN (=number caught per net night)

	7	0.02	76	0	0.00
	9	0.07	94	0	0.00
	10	0.19	104	0	0.00

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
	11	0.10	111	0		0.00
TN	Total	0.38	102			0.00
	S.E.		2.2			
SPD	Total	0.38	102			0.00
	S.E.		2.2			
Standard Unit Catch						
% by Number		0.7 %.	% by Weight		0.0 %.	

WCT Westslope Cutthroat trout						
HSGN (=number caught per hour of sinking gill net)						
	19	0.04	196	68		0.00
	20	0.02	207	70		0.00
	30	0.02	300	240		0.00
	34	0.04	345	358		0.01
	36	0.02	363	415		0.01
	37	0.02	370	490		0.01
	38	0.04	380	500		0.02
	HSGN Total	0.18	308	285		0.06
	S.E.		24.8	59.9		
SGN (=number caught per sinking gill net night)						
	35	2.50	355	400		1.00
	SGN Total	2.50	355	400		1.00
	S.E.					
TN (=number caught per net night)						
	11	0.05	116	10		0.00
	12	0.02	120	15		0.00
	13	0.02	130	0		0.00
	15	0.02	151	0		0.00
	26	0.02	262	0		0.00
	TN Total	0.14	149	13		0.00
	S.E.		23.3	2.5		
WCT	Total	2.82	255	249		1.06
	S.E.		25.5	55.4		
Standard Unit Catch						
% by Number		5.0 %.	% by Weight		8.5 %.	

WRB Wild (natural) rainbow/redband						
HSGN (=number caught per hour of sinking gill net)						
	20	0.02	206	0		0.00
	23	0.02	230	0		0.00

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
	24	0.02	240	150	99.13	0.00
	30	0.02	300	0		0.00
	33	0.02	335	310	72.91	0.01
	34	0.02	348	315	65.84	0.01
	35	0.08	352	388	77.54	0.03
	36	0.06	364	423	78.26	0.03
	37	0.02	375	480	79.60	0.01
	38	0.04	383	469	73.26	0.02
HSGN	Total	0.32	331	382		0.10
	S.E.		14.1	31.4		
SGN	(=number caught per sinking gill net night)					
	18	0.25	180	50	80.56	0.01
	24	0.25	247	150	81.61	0.04
	25	0.25	250	140	81.53	0.04
	33	0.25	330	310	64.06	0.08
	34	0.75	345	315	77.87	0.24
	35	0.75	354	388	71.86	0.29
	36	0.25	360	423	72.45	0.11
	37	0.50	374	480	71.84	0.24
	38	0.25	380	469	68.44	0.12
SGN	Total	3.50	328	317		1.15
	S.E.		15.8	33.5		
TN	(=number caught per net night)					
	10	0.03	105	8	68.46	0.00
	11	0.03	110	24	177.82	0.00
	12	0.05	124	12	55.60	0.00
	13	0.05	134	19	73.49	0.00
	14	0.03	142	20	67.18	0.00
	26	0.10	263	267	131.83	0.03
	27	0.03	270	195	89.47	0.01
	28	0.05	282	227	91.31	0.01
	30	0.03	301	0	80.27	0.00
	31	0.05	315	0		0.00
	32	0.08	322	276	74.04	0.02
	33	0.13	335	310		0.04
	34	0.28	345	315	80.92	0.09
	35	0.39	355	388	78.04	0.15
	36	0.26	364	423	79.98	0.11
	37	0.10	372	480	79.95	0.05
	38	0.13	382	469	82.76	0.06
	39	0.03	390	500	73.43	0.01
	40	0.03	400	0		0.00
TN	Total	1.86	323	331		0.58
	S.E.		8.5	24.8		

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
WRB	Total	5.68	325	336		1.83
	S.E.		6.7	17.8		

Standard Unit Catch

% by Number 10.0 % % by Weight 14.8 %.

Total Number 56.7 Total Weight 12.42 kg.

Units of Effort by Geartype for this date.

*Geartype Units of Effort for
this Survey*

TN	42
SGN	4
HSGN	66

^a

Number sampled is reported as total catch per unit of effort. Units of effort include: AN - Total angling catch; EF (Electrofishing) - 3600s (1 hour) of activated electrode time; FGN - (Floating Gill Net) - One 45.7 m floating gill net set overnight; GN - (Gill Nets) - 1-45.7m floating and 1-45.7m sinking gill net set overnight; SGN - (Sinking Gill Net) - One 45.7m sinking gill net set overnight; TN - (Trap Net) - One trap net set overnight; VGN - (Vertical Gill Net) - One vertical gill net set overnight; HSGN- (Hourly Sinking Gill Net)- One sinking gill net set on an per hour basis.

Table 3. Summary of catch statistics for the sample period of 6/10/97 to 6/12/97 on Deadwood Reservoir.

Lowland Lake Fish Sample Report

Lake Name		DEADWOOD RES			Sample Date	6/10/97
Water Number		0900000117			Relative	Biomass
	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Weight	(kg)
BLT	Bull trout					
TN	(=number caught per net night)					
	25	0.04	250	150		0.01
TN	Total	0.04	250	150		0.01
	S.E.					
BLT	Total	0.04	250	150		0.01
	S.E.					
Standard Unit Catch						
% by Number		0.3 %.		% by Weight		100.0 %.
GRB	Gerrard rainbow trout					
TN	(=number caught per net night)					
	44	0.04	440	0		0.00
	56	0.04	560	0		0.00
TN	Total	0.08	500			0.00
	S.E.		60.0			
GRB	Total	0.08	500			0.00
	S.E.		60.0			
Standard Unit Catch						
% by Number		0.7 %.		% by Weight		0.0 %.
KOK	Kokanee salmon					
HSGN	(=number caught per hour of sinking gill net)					
	31	0.04	310	0		0.00
HSGN	Total	0.04	310			0.00
	S.E.					
KOK	Total	0.04	310			0.00
	S.E.					
Standard Unit Catch						
% by Number		0.3 %.		% by Weight		0.0 %.
MWF	Mountain whitefish					
HSGN	(=number caught per hour of sinking gill net)					
	21	0.06	215	0		0.00

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
	22	0.12	223	0		0.00
	23	0.37	233	0		0.00
	24	0.31	240	0		0.00
	25	0.43	254	0		0.00
	26	0.31	263	0		0.00
	27	0.43	271	0		0.00
	28	0.55	282	0		0.00
	29	0.25	291	0		0.00
	30	0.31	303	0		0.00
	31	0.12	313	0		0.00
	32	0.25	324	0		0.00
	33	0.49	331	0		0.00
	35	0.37	353	0		0.00
	36	0.12	360	0		0.00
	37	0.12	373	0		0.00
	39	0.06	390	0		0.00
HSGN Total		4.68	290			0.00
S.E.			5.0			
TN	(=number caught per net night)					
	8	0.06	80	0		0.00
	12	0.06	120	0		0.00
	13	0.06	130	0		0.00
	14	0.06	140	0		0.00
	17	0.06	170	0		0.00
	20	0.11	200	0		0.00
	22	0.06	220	0		0.00
	23	0.06	235	0		0.00
	25	0.11	250	0		0.00
	26	0.06	260	0		0.00
	27	0.28	273	0		0.00
	28	0.17	280	0		0.00
	29	0.22	291	0		0.00
	30	0.06	300	0		0.00
	31	0.06	310	0		0.00
	32	0.11	323	0		0.00
	33	0.17	332	0		0.00
TN	Total	1.71	254			0.00
	S.E.		12.0			
MWF	Total	6.39	279			0.00
	S.E.		5.2			
Standard Unit Catch						
% by Number		52.0 %.	% by Weight		0.0 %.	
RSS		Redside shiner				

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
TN	(=number caught per net night)					
	7	0.40	70	0		0.00
	8	1.61	83	0		0.00
	10	0.81	100	0		0.00
	11	1.61	110	0		0.00
	12	0.40	125	0		0.00
TN	Total	4.83	97			0.00
	S.E.		4.8			
RSS	Total	4.83	97			0.00
	S.E.		4.8			
Standard Unit Catch						
	% by Number	39.3 %.		% by Weight	0.0 %.	
SPD	Speckled dace					
TN	(=number caught per net night)					
	10	0.58	100	0		0.00
TN	Total	0.58	100			0.00
	S.E.		0.0			
SPD	Total	0.58	100			0.00
	S.E.		0.0			
Standard Unit Catch						
	% by Number	4.7 %.		% by Weight	0.0 %.	
WCT	Westslope Cutthroat trout					
HSGN	(=number caught per hour of sinking gill net)					
	34	0.08	340	0		0.00
HSGN	Total	0.08	340			0.00
	S.E.		0.0			
WCT	Total	0.08	340			0.00
	S.E.		0.0			
Standard Unit Catch						
	% by Number	0.7 %.		% by Weight	0.0 %.	
WRB	Wild (natural) rainbow/redband					
HSGN	(=number caught per hour of sinking gill net)					
	35	0.08	350	0		0.00
HSGN	Total	0.08	350			0.00
	S.E.		0.0			

	Length Group (cm)	Number Sampled	Mean Length (mm)	Mean Weight (g)	Relative Weight	Biomass (kg)
TN	(=number caught per net night)					
	25	0.04	256	0		0.00
	28	0.04	285	0		0.00
	32	0.04	320	0		0.00
	35	0.04	350	0		0.00
TN	Total	0.17	303			0.00
	S.E.		20.5			
WRB	Total	0.25	319			0.00
	S.E.		16.3			

Standard Unit Catch

% by Number 2.0 % % by Weight 0.0 %.

Total Number 12.3 Total Weight 0.01 kg.

Units of Effort by Geartype for this date.

*Geartype Units of Effort for
this Survey*

TN 24
HSGN 25

^a

Number sampled is reported as total catch per unit of effort. Units of effort include: AN - Total angling catch; EF (Electrofishing) - 3600s (1 hour) of activated electrode time; FGN - (Floating Gill Net) - One 45.7 m floating gill net set overnight; GN - (Gill Nets) - 1-45.7m floating and 1-45.7m sinking gill net set overnight; SGN - (Sinking Gill Net) - One 45.7m sinking gill net set overnight; TN - (Trap Net) - One trap net set overnight; VGN - (Vertical Gill Net) - One vertical gill net set overnight; HSGN - (Hourly Sinking Gill Net)-One sinking gill net set on an hourly basis .

Table 4. Dates of radio tracking in the Deadwood River drainage for radio tagged bull trout and locations of any located radio signals from June 1997 through September 1997.

Date	Method of tracking	Radio frequency	Location of radio tagged bull trout
6/13/97	boat	151.763	Trail Creek arm ,nearest cove to mouth of Trail Creek
6/27/97	boat	151.882	Trail Creek arm, nearest cove to mouth of Trail Creek
7/25/97	boat/truck	none	
8/22/97	boat	none	
8/1/97	aircraft	151.763	Mid reservoir on east side , very weak signal
8/1/97	aircraft	151.882	Trail Creek arm, nearest cove to to mouth of Trail Creek
9/12/97	aircraft	151.882	Trail Creek, just above forest road crossing

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- Ross, M.J. and C.F. Kleiner. 1982. Shielded-needle Technique for Surgically Implanting Radio-Frequency Transmitters in Fish. *Progressive Fish Culturist* 44(1):41-43.

APPENDICES

Appendix A. Stream location of tributary sampling sites in the Deadwood River basin sampled in 1997.

Stream and Section	Date	EPAREACH	Length	Town	Ran	Sec	Location description	Elev	BLT/100m ²
Basin Creek 01	8/13/97	17050120048		12N	7E	30	Begin at FS road upstream	5340	
Beaver Creek 01	8/14/97	17050120047		11N	6E	1	Begin at mouth upstream for 3 hour	5310	
Daisy Creek 01	8/6/97	17050120044	32	11N	6E	25	Mouth of Daisy upstream	5600	2.44
Deadwood River 01	7/22/97	17050120048	183	10N	7E	29	First bend N of first brige above reservoir	5340	
Deadwood River 02	7/22/97	17050120048	70	10N	7E	21	Upstream of milepost 6	5355	
Deadwood River 03	7/22/97	17050120048	105	12N	7E	10	Two track crossing of river below Deer Cr.	5490	
Deadwood River 04	7/22/97	17050120048	121.3	13N	7E	27	Milepost 0 where Deer Cr road joins Deadwood River Rd.	5560	
Deadwood River 05	7/23/97	17050120048	84	13N	7E	14	Deadwood mine area at unnamed creek mouth	5590	
Deadwood River 06	7/23/97	17050120048	84.6	13N	7E	1	At mouth of Top Notch Cr.	5680	
Deadwood River 07	7/23/97	17050120048	70	14N	7E	35	Directely below old power dam for the mine	5840	1.4
Deadwood River 08	7/23/97	17050120048	36	14N	7E	26	50 m above Deadwood River upper bridge	6000	5.3
Deer Creek, NF 03	8/19/97	17050120048	45.6	13N	8E	31	Above Road Crossing at Deer Cr summit	6211	2.56
Deer Creek, NF 04	8/20/97	17050120048		13N	8E	30	Section starts approx 1 mile above road crossing near Deer Cr	6600	
Deer Creek, SF 01	8/18/97	17050120048		12N	8E	6	Approx. one mile upstream of Deer Park Campground	6360	
Deer Creek, SF 02	8/19/97	17050120048		12N	8E	18	Meadows above canyon in upper drainage	6720	
Deer Creek, SF 03	8/18/97	17050120048		12N	8E	6	Deer Flat Campground and upstream	6200	
Habit Creek 01	8/13/97	17050120047		12N	7E	31	Begin at mouth	5310	
Moulding Creek 01	8/7/97	17050120044		11N	7E	18	Begin at mouth up to road	5310	
South Fork Beaver Creek 01	8/7/97	17050120047		11N	6E	12	Begin at mouth upstream 3 hours	5310	
Stratton Creek 01	8/21/97	17050120048		13N	7E	11	Section is above pack trail crossing	5620	
Stratton Creek 02	8/21/97	17050120048		13N	7E	10	Top end of drainage where grad. flattens out	5620	
Trail Creek 01	8/5/97	17050120044	71	11N	7E	19	Begins at Reservoir upstream to bridge	5400	2.49
Trail Creek 02	8/6/97	17050120044	67	11N	6E	26	Above Daisy Creek	5600	1.67
Wild Buck Creek 01	8/7/97	17050120048		12N	7E	29	Begins at FS road upstream	5350	
Wild Buck Creek 02	8/14/97	17050120048		12N	7E	20	Approximately 1.5 miles above FS road	5400	

Appendix B. Species composition and length frequency for all tributaries sampled in the Deadwood River drainage in 1997.

<i>Stream and Section</i>	<i>SPECIES_NAME</i>	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	37	
Beaver Creek 01	Bull trout								1		1		1						1																	
Daisy Creek 01	Bull trout								1	3			2	2	2	2	2																			
Deadwood River 01	Hatchery rainbow																				2															
	Mottled sculpin							2																												
	Mountain whitefish	2															2					2					2	2	2		4					
	Redside shiner						10	2		2	2																									
	Westslope cutthroat							4	2		4	4			2																					
	Wild rainbow/redband					2	12		2				2							2																
Deadwood River 02	Mountain whitefish													2					2						2					2						
	Wild rainbow/redband								20																											
Deadwood River 03	Mottled sculpin						2																													
	Mountain whitefish																							2	2											
	Westslope cutthroat										2																									
	Wild rainbow/redband					2	4																												2	
Deadwood River 04	Mottled sculpin								2																											
	Mountain whitefish																						2	2	2	4	4	6	6						2	
	Westslope cutthroat						6	6	6	6	2		6		2		2																			
	Wild rainbow/redband				4	14	10	2		4																										
Deadwood River 05	Mottled sculpin				2																															
	Mountain whitefish																								6	4	4	14	12	8	2	4	2			2
	Westslope cutthroat				12	18	10	4																												
	Wild rainbow/redband					6																														
Deadwood River 06	Mottled sculpin				2	8	4																													
	Mountain whitefish																							2	2	4	6	6	6	4	2					
	Westslope cutthroat				6	6	4	2		14	6	2	2			2																				

<i>Stream and Section</i>	<i>SPECIES_NAME</i>	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	37		
	Wild rainbow/redband					4	8			2																											
Deadwood River 07	Bull trout							2					2	2	4	4	2		2																		
Deadwood River 08	Bull trout				2	4	10			6			2	4		4																					
Deer Creek, NF 03	Bull trout						18	11	8	3	6	12	15	8	3	1			1																		
Deer Creek, NF 04	Bull trout																																				
Deer Creek, SF 01	Bull trout		1				2	1			1	2	1	2	4	1	1	3			1	1															
Deer Creek, SF 02	Bull trout					1				1		2																									
Deer Creek, SF 03	Bull trout				4	4	1	2	5	6	2		1	1	1																						
	Bull trout						1	1			1	2	1	1	1	1	1																				
Habit Creek 01	Bull trout															1																					
South Fork Beaver Creek 01	Bull trout																1																				
	Bull trout									1			1	1																							
Stratton Creek 01	Bull trout																1	1	1																		
Trail Creek 01	Bull trout				3		7	3		1	9	1	2	3	1		4	1	1		1																
Trail Creek 02	Bull trout						2		2	10	4	3	3	3	1	3	5	2	2	1																	1
Wild Buck Creek 01	Sculpin spp.						1																														
	Westslope cutthroat										1																										
	Wild rainbow/redband									1		1																									
Wild Buck Creek 02	Bull trout		1				7	6					1	2	1		1			1	1	1															

Submitted by:

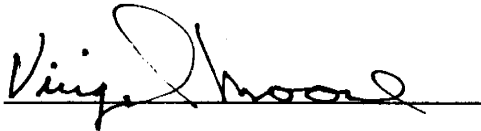
Dale B. Allen
Regional Fisheries Biologist
Southwest Region

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

A handwritten signature in black ink, appearing to read "Al Van Vooren", written over a horizontal line.

Al Van Vooren
Regional Supervisor

A handwritten signature in black ink, appearing to read "Virgil Moore", written over a horizontal line.

Virgil Moore, Chief
Bureau of Fisheries